

## BOOK REVIEWS

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**Kin Recognition in Animals.**—D. J. C. Fletcher and C. D. Michener, eds. 1987. John Wiley & Sons Ltd., New York. 465 pp. Hardbound \$77.95.

Recognition of kin is a critically important ability in most animals; its functional significance impinges upon all social interactions among conspecific individuals, including mating. As biologists have become more interested in the evolution of social behaviors, the literature on kin recognition has increased dramatically. This book makes a large proportion of this literature accessible in a single volume by compiling information across taxa from isopods to humans, and it is more cohesive and comprehensive than some collected works. Four introductory chapters establish the context for eight review chapters, six of which cover the literature on kin recognition for a broadly specified taxonomic group. Of the two remaining chapters, one considers kin recognition in *Drosophila* and the other focuses on the desert isopod *Hemilepistus reaumuri*.

The volume contains several cohesive themes throughout, yet each chapter bears the stamp of the individual author(s). Following a short introductory chapter by D. J. C. Fletcher and C. D. Michener, E. O. Wilson provides a clear synopsis of the functions of kin recognition, provides a useful glossary of terms, and briefly touches on the bioassays, proximate mechanisms, genetics and economics involved. J. D. C. Fletcher briefly outlines the functions and mechanism of kin recognition and then focuses on methodological considerations. Proposed genetic mechanisms leading to the evolution of kin recognition systems are discussed succinctly by R. H. Crozier.

These chapters provide the framework for those that follow. E. B. Spiess summarizes the arguments for the rare male effect in *Drosophila* illustrating the potential importance of kin recognition in mate selection. A long and somewhat rambling chapter by K. E. Linsenmair is a fascinating account of research on the subsocial desert isopod *H. reaumuri* that includes a considerable amount of material not previously published. The chapter on primitively eusocial insects by C. D. Michener and B. H. Smith is fairly brief and concentrates primarily on the kin recognition systems of halictine bees and polistine wasps but also touches on bumble bees and vespine wasps. The review of kin recognition in highly social insects, by M. D. Breed and B. Bennett, covers the considerable information on honey bees and ants and points out the lack of information available for termites. These chapters on invertebrates are followed by a series of contributions on vertebrates.

For vertebrates other than primates, A. R. Blaustein, M. Beckoff, and T. J. Daniels provide an overview of empirical evidence followed by a consideration of mechanisms, functions and the direction of future research. Research on primates other than humans is reviewed by J. R. Walters, who calls for an increase in empirical studies aimed at illuminating recognition mechanisms in non-human primates. P. A. Wells' chapter discusses the largely inferential evidence of kin recognition in humans.

This impressive collection of scholarly review chapters is aptly concluded by W.

D. Hamilton, who discusses the application of evolutionary concepts such as kin recognition and nepotism to humans and the controversy such generalizations engender. He considers the possible role of nepotism in human history, and calls for preservation of and respect for human racial and cultural diversity.

The basic approach taken by this work is an evolutionary one. As such it is complementary to the excellent and somewhat broader volume on recognition by Colgan (1983), which takes a more mechanistic perspective. Though *Kin Recognition in Animals* is quite broad, certain taxa are not well covered, such as sessile, colonial invertebrates and fish.

This book, with its extensive reviews of kin recognition over a broad range of taxa, will be a valuable reference book for advanced students, teachers, and researchers in social behavior and is a must for anyone seriously interested in kin recognition.—*Penelope F. Kukuk, Department of Entomology, Cornell University, Ithaca, New York 14853.*

#### LITERATURE CITED

Colgan, P. 1983. *Comparative Social Recognition*. John Wiley & Sons, Ltd., New York, 281 pp.

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**Pheromones of Social Bees.**—John B. Free. 1987. Cornell University Press, Ithaca, New York. xiii + 218 pp. \$29.95 (cloth).

In this modest 218 page compilation of research of the past 100 years, John Free applies his 30+ years of experience with bumblebees and honeybees to the task of summarizing our knowledge of the releasing and priming pheromones of the true honeybees, bumblebees, stingless bees, and even sweat bees, emphasizing, of course, *Apis mellifera*. Allomones and kairomones are by definition not addressed, nor are the semiochemicals of the non-eusocial bees, the latter having been summarized by Duffield et al. (1984). Pheromones, those ubiquitous intraspecific chemical messages that characterize Life, are the subject of this book, including queen, brood and worker pheromones.

The book is rightly organized by the sundry functional responses to pheromones, rather than by molecular class or glandular source. The functions are diverse, ranging from regulation of worker ovarian development and nestmate recognition to drone attraction and worker alarm. Free's task is not enviable, for the burgeoning literature of the biology of *Apis mellifera* is only exceeded by that of a few animals, such as the Norway rat and ourselves. Furthermore, social bees have been actively studied by groups on every continent, published in sometimes obscure or unexpected journals in several languages, and too often require careful *a posteriori* interpretation of an author's claimed evidences. Although Free may be a bit overly enthusiastic as to the sheer multiplicity of pheromones among the social bees, he is generally careful to weight conclusions judiciously as to whether they reflect independently confirmed pheromonal investigations, as yet unduplicated experimental results, or reports that